

*If you are using a printed copy of this procedure, and not the on-screen version, then you **MUST** make sure the dates at the bottom of the printed copy and the on-screen version match. The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A.*

C-A OPERATIONS PROCEDURES MANUAL

7.1.17 Regeneration of Heat Exchanger 1A/2A

Text Pages 2 through 5

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Approved: _____ ***Signature on File*** _____
Collider-Accelerator Department Chairman Date

S. Sakry

7.1.17 Regeneration of Heat Exchanger 1A/2A

1. Purpose

This procedure provides instructions for regenerating heat exchanger 1A/2A on the RHIC 25 kW Helium Refrigerator. This procedure shall be performed when heat exchanger 1A/2A is contaminated and has been taken offline. The steps necessary to take heat exchanger 1A/2A offline are not covered under this procedure, please reference [C-A OPM 7.1.16](#).

2. Responsibilities

- 2.1 The Shift Supervisor, or an Operator designated by the Shift Supervisor, is responsible for conducting the procedure and providing documentation in the Cryogenic Control Room Log and in the Cryogenic Valve Log.
- 2.2 Should a problem arise in the process of regenerating the heat exchanger, the Shift Supervisor shall report to the Technical Supervisor for instructions before continuing.

3. Prerequisites

- 3.1 The Operator shall be trained by the Shift Supervisor.
- 3.2 Operator shall be familiar with the refrigerator P&ID drawing 3A995009, the physical location of components on the refrigerator, and the refrigerator control pages found on the CRISP control system. Valves and equipment mentioned in this procedure will be found on drawing 3A995009.
- 3.3 The regeneration skid must be available for use.
- 3.4 Oxygen monitor and hygrometer in compressor room are set to read compressor discharge.

4. Precautions

- 4.1 If there is liquid helium in the refrigerator pots, all personnel entering the refrigeration wing of 1005R must be ODH Class 1 qualified, have a Personal Oxygen Monitor (POM), and carry an emergency escape pack.

5. Procedure

_____ 5.1 Date _____

_____ 5.2 Ensure the following valves are CLOSED:

Process Valves:

H314A_____	H316M_____	H324M_____
H315M_____	H317M_____	H313M_____

Valves to atmosphere, relief valve, or vacuum:

H319M_____	H448M_____	H457M_____
H321M_____	H455M_____	H1109A_____
H323M_____	H456M_____	

_____ 5.3 Ensure the following valves are OPEN:

Process Valves:

H422M_____

_____ 5.4 Start the regeneration (regen) skid per [C-A-OPM 7.1.36](#), "Regeneration System Normal Operation".

_____ 5.5 Open the following valves:

H9102M_____	H322M_____
H9103M_____	H9105M_____
H9104M_____	H447M_____
H318M_____	H9101M_____
H320M_____	H305M_____

_____ 5.6 Close regen bypass valve H9100M.

_____ 5.7 Turn on regen skid pre-heater.

_____ 5.8 Monitor sensors TI308, TI309, TI310, TI11, TI865, TI866 and TI867.

_____ 5.9 When the above sensors reach 310°K, continue to regenerate for at least 1 hour. Hygrometer reading must be -20°C to -40°C and improving less than 0.5°C/hr.

- _____ 5.10 Turn off regen skid preheater.
- _____ 5.11 Open valve H9100M.
- _____ 5.12 Close the following valves:
- | | |
|-------------|-------------|
| H305M_____ | H322M_____ |
| H447M_____ | H9102M_____ |
| H9105M_____ | H9103M_____ |
| H318M_____ | H9104M_____ |
| H320M_____ | |
- _____ 5.13 Secure the regeneration skid per [C-A-OPM 7.1.36](#).
- _____ 5.14 Introduce pure helium into heat exchanger 1A/2A by cracking open valve H306_____. Immediately crack open the following valves to purge heat exchanger 1A/2A:
- | | |
|------------|------------|
| H319M_____ | H455M_____ |
| H321M_____ | H456M_____ |
| H323M_____ | H457M_____ |
- _____ 5.15 Adjust valves in previous step as necessary until an audible purge is heard.
- _____ 5.16 Allow heat exchanger 1A/2A to purge for 30 minutes at an audible level.
- _____ 5.17 Close the following valves:
- | | |
|------------|------------|
| H319M_____ | H455M_____ |
| H321M_____ | H456M_____ |
| H323M_____ | H457M_____ |
- _____ 5.18 When PI444H reaches 250 PSIA, close valves H306M_____ and H9101M_____.
- _____ 5.19 Open valves H315M_____, H316M_____ and H317M_____ as a sign that heat exchanger 1A/2A has been regenerated and is ready for service.

6. Documentation

- 6.1 The check-off lines on the procedure are for place-keeping only. The procedure is not to be initialed or signed, it is not a record.
- 6.2 The Shift Supervisor shall document the completion of the procedure in the Cryogenics Control Room Log

7. References

- 7.1 Drawing 3A995009, 25KW Helium Refrigerator P&ID.
- 7.2 [C-A-OPM 7.1.16](#), "Heat Exchanger 1B/2B Online and Heat Exchanger 1A/2A Offline".
- 7.3 [C-A-OPM 7.1.36](#), "Regeneration System Normal Operation".

7. Attachments

None